

AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior listings, and all prior versions, of claims in the application.

LISTING OF CLAIMS:

1. (Currently Amended) A position measuring apparatus for measuring a position of a tool and indicating a position where the tool is working, the position measuring apparatus comprising:

a position indicating means for indicating a position and a direction of a tool, said position indicating means comprising a pair of laser beam emitting means for emitting respective laser beams that intersect at one of a surgical field of a patient and a predetermined portion of the tool; and

a three-dimensional position measuring means for measuring a position and a direction of ~~an~~ a surgical field and also the position and the direction of said tool, ~~wherein said position indicating means and said three-dimensional position measuring means are~~ being fixed on a common base, so that relative positional relationship therebetween is constant; and

a control unit for controlling operation of said position indicating means and said three-dimensional position measuring means;

wherein said control unit controls said pair of laser beam emitting means to emit the respective laser beams to intersect at an intersection point on the surgical field of the patient which identifies a placement location for the tool, and

wherein, after the tool has been moved to the placement location, said control unit controls said pair of laser beam emitting means to emit the respective laser beams on the predetermined portion of the tool.

2. (Cancelled).

3. (Previously Presented) A position measuring apparatus, as described in the claim 2, wherein said position measuring apparatus is held on a stand, which is changeable, at position and with any direction thereof, the stand having casters to be movable.

4. (Previously Presented) A position measuring apparatus, as described in the claim 2, wherein said position measuring apparatus is held by an arm, the arm extending from a ceiling and being changeable at least either one of a position and a direction of the position measuring apparatus.

5. (Original) A position measuring apparatus, as described in the claim 1, wherein said position measuring apparatus is used for indicating a position and a direction of a surgical tool during a surgical operation.

6. (Original) A position measuring apparatus, as described in the claim 2, wherein said position measuring apparatus is used for indicating a position and a direction of a surgical tool during a surgical operation.

7. (Cancelled).

8. (Withdrawn) A position measuring apparatus, comprising:
a position indicating means being able to indicate a position and a direction of a tool;

a three-dimensional position measuring means for measuring a position and a direction of a surgical field and also the position and the direction of said tool;

at least two (2) pieces of laser beam emitting means, being provided in said position indicating means, each being controllable in an emit angle of the laser beam; and

means for calculating a setting position and a direction of said laser beam emitting means from the emit angles of two (2) pieces of the laser beams and laser beam emitting positions which are measured by said three-dimensional position measuring means.

9. (Withdrawn) A position measuring apparatus, as described in the claim 8, further comprising means for identifying the setting position and direction of said laser beam emitting means from the emit angles of said two (2) pieces of laser beam emitting means and at least four (4) pieces of data on the laser beam emitting positions, which are measured by said three-dimensional position measuring means.

10. (Withdrawn) A position measuring apparatus, as described in the claim 8, wherein measurements are conducted on coordinates at two (2) points different from each other in a first emit direction of the laser beam emitted from said laser beam emitting means, a coordinate at one (1) point when changing the emit direction of said laser beam emitting means into a second direction differing from that first direction, and a coordinate at one (1) point when changing the emit direction of said laser beam emitting means into a third emit direction non-including a plane including both said first emit direction and said second emit direction, and thereby identifying

the setting position and direction of said laser emitting means from the emit angle of laser beam and coordinates of the laser emitting positions, which are measured.

11. (Withdrawn) A position measuring apparatus, as described in the claim 8, further comprising means for obtaining a target position of laser beam emit in coordinate system, each defining the setting position and direction of said laser beam emitting means, and for obtaining the emit angle of the laser beam of said laser beam emitting means from the target position.

12. (Withdrawn) A position measuring apparatus, as described in the claim 8, wherein said laser beam emitting means comprises a plural number of galvano-scanners, and mirrors each being attached rotatable onto each of said galvano-scanners, and the position and the direction of the surgical tool are indicated by controlling angles of said mirrors.

13. (Withdrawn) A position measuring apparatus, as described in the claim 8, wherein said calculating means obtains the emit angles for said laser beam emitting means to emit onto points locating at both ends of a line segment, from coordinates at both ends about the line segment, which include a target position of said tool therein and are defined by the target position and the direction, and the setting position and the direction of said laser beam emitting means, and said laser beam emitting means control the emit angles obtained for each of said laser beam emitting angles in synchronism with each other.